



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/766,122	01/18/2001	Joseph Shu	AP102HO	1152

20178 7590 01/02/2004

EPSON RESEARCH AND DEVELOPMENT INC
INTELLECTUAL PROPERTY DEPT
150 RIVER OAKS PARKWAY, SUITE 225
SAN JOSE, CA 95134

EXAMINER

LAROSE, COLIN M

ART UNIT	PAPER NUMBER
----------	--------------

2623

DATE MAILED: 01/02/2004

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/766,122

Applicant(s)

SHU ET AL.

Examiner

Colin M. LaRose

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-5, 7-13, 15-21, 23, and 24 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent 6,160,913 by Lee et al. ("Lee").

Regarding claims 1, 9, and 17, Lee discloses a method/apparatus/computer program (figure 1) for removing image artifacts from a representation of an image comprising the steps of:

- a) obtaining a pixel representation of the image (12: greyscale image data is obtained);
- b) classifying each pixel in the image as a screen or non-screen pixel (figure 4 is a detailed flowchart of block 16: in block 402, pixels are classified as halftone (screen) or continuous tone (non-screen) pixels);
- c) examining pixels in a predetermined surrounding area of each pixel to check the classification of that pixel as determined in step b (406, figure 4: pixels are re-classified as halftone or continuous tone using a 7x7 moving window);
- d) selectively applying a low pass filter to pixels in the image, such that, when the low pass filter is applied, a center of the low pass filter is selectively shifted relative to a current pixel based on the examining in step c (24, figure 1 and column 9, lines 7-24: the low pass median filter is selectively applied to the image based on the final classification of the pixels as

Art Unit: 2623

determined in step c – the filter is only performed on the halftone (i.e. screen) pixels; thus, when the filter is applied on a current pixel, it is shifted to a new screen pixel).

Regarding claims 2, 10, and 18, Lee discloses the classifying step b comprises applying a first mask of a predetermined size centered on the pixel being classified to determine if the center pixel is in an area having a screened halftone pattern (402, figure 4: a 5x5 mask is applied to determine if the area is a halftone area; Lee's system appears to be applicable to images with screened halftone areas (column 1, lines 40-50), which are known to exhibit a periodic pattern).

Regarding claims 3, 11, and 19, Lee discloses the first mask is divided into a plurality of overlapping areas, the center pixel being in each of the first mask areas (the 5x5 mask comprises four 3x3 areas that all overlap the center pixel – i.e. each of the 3x3 areas originate at a different corner of the 5x5 mask).

Regarding claims 4, 12, and 20, Lee discloses the examining step c comprises applying a second mask of a predetermined size centered on the pixel being checked (406, figure 4: predetermined 7x7 size mask is used).

Regarding claims 5, 13, and 21, Lee discloses the second mask is divided into a plurality of overlapping areas, the center pixel being in each of the second mask areas (the 7x7 mask comprises four 4x4 areas that all overlap the center pixel – i.e. each of the 4x4 areas originate at a different corner of the 7x7 mask).

Regarding claims 7, 15, and 23, Lee discloses that the selectively applying step e comprises selectively applying the low pass filter based on which of the plurality of second mask areas contains screen pixels (24, figure 1 and column 9, lines 7-24: the low pass median filter is

Art Unit: 2623

selectively applied to the image based on the final classification of the pixels as determined in step c; and the final classification is based on which of the mask areas contain screen pixels, and more particularly, which areas contain a certain number of screen pixels – 610, figure 8: the number of screen pixels in the window determines whether the center pixel is labeled as screen or non-screen).

Regarding claims 8, 16, and 24, Lee discloses

f) determining a feature indicator for at least a portion of the image (block 16 of figure 1 produces a halftone region map, which indicates features of the pixels in the image – i.e. indicates which pixels are halftone (screen) pixels); and

g) adaptively softening the at least one portion of the image based on the determined feature indicator (24, figure 1: the portions of the image indicated as halftone are softened).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

Art Unit: 2623

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 6, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee.

Regarding claims 6, 14, and 22, Lee does not expressly disclose the halftone regions have a periodic line or dot pattern having a period of 2 or 3, however, it is apparent that Lee's system is operative to detect halftone patterns with a period of 2 or 3. Figures 6 and 7 show pixel patterns that Lee classifies as "non-halftone" since they contain at least three consecutive black pixels. All pixel patterns that contain less than three consecutive pixels are classified as "halftone". Since Lee's system utilizes a window that is only five pixels wide, it is suitable for detecting halftone patterns with small periods, such as 2 or 3 (i.e. one or two white pixels in between two black pixels). The exact frequency of the halftone region depends on the characteristics of the inputted image and does not impinge on the operation of Lee's system.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,798,846 by Tretter

U.S. Patent 6,633,411 by Rao et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489.

Art Unit: 2623

The examiner can normally be reached Monday through Thursday from 8:00 to 5:30. The examiner can also be reached on alternate Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.

CML

Group Art Unit 2623

15 December 2003


AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600